

Practice: 512 - Forage and Biomass Planting**Scenario:** #1 - Cool Season, Establish or Reseed

Scenario Description: Establish/reseed adapted perennial introduced cool season grasses and legumes. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture or hayland. Assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Does not include foregone income for conversion of cropland.

Before Situation: Typically installed on an a poor or nonexistent stand of grass species. Resource concerns include: sheet and rill erosion, ephemeral gully erosion, decreased water quality from runoff of sediment, low soil quality (including organic matter depletion) and low species diversity.

After Situation: Field is prepared for seeding, and lime and nutrients are spread according to soil test results. Cool season grasses and legumes are established on pasture or hayland. Erosion is minimized and there is reduced sedimentation and nutrient runoff. Water and soil quality is improved (including an increase in organic matter).

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$4,862.23

Scenario Cost/Unit: \$486.22

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	500	\$301.16
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	500	\$390.64
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	10	\$541.04

Equipment Installation

Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Practice: 512 - Forage and Biomass Planting**Scenario:** #2 - Cool Season, Establish or Reseed, Foregone Income

Scenario Description: Establish adapted perennial introduced cool season grasses and legumes. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture or hayland. Assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Includes foregone income for conversion of cropland, typically silage corn, to pasture or hay.

Before Situation: Typically installed on a 10 acre corn field that being converted to long-term grazing or hay. Resource concerns include: sheet and rill erosion, ephemeral gully erosion, decreased water quality from runoff of sediment and/or manure from the field, and low soil quality (including organic matter depletion) from continuous cropping of silage corn.

After Situation: Field is prepared for seeding, and lime and nutrients are spread according to soil test results. Cool season grasses and legumes are established on pasture or hayland. Erosion is minimized and there is reduced sedimentation and nutrient runoff. Water and soil quality is improved (including an increase in organic matter).

Scenario Feature Measure: Acres of Forage and Biomass Planting**Scenario Unit:** Acre**Scenario Typical Size:** 10**Total Scenario Cost:** \$7,682.34**Scenario Cost/Unit:** \$768.23**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	500	\$301.16
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	500	\$390.64
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	10	\$541.04

Equipment Installation

Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	10	\$3,463.58
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$42.90	-15	(\$643.47)

Practice: 512 - Forage and Biomass Planting**Scenario:** #3 - Cool Season, Establish or Reseed, Organic

Scenario Description: Establish/reseed adapted organic perennial introduced cool season grasses and legumes. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture or hayland. Assumes nutrients, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Typically installed on an a poor or nonexistent stand of grass species that is certified organic or transitioning to organic. Resource concerns include: sheet and rill erosion, ephemeral gully erosion, decreased water quality from runoff of sediment, low soil quality (including organic matter depletion) and low species diversity.

After Situation: Field is prepared for seeding, and lime and nutrients are spread according to soil test results. Organic cool season grasses and legumes are established on pasture or hayland. Erosion is minimized and there is reduced sedimentation and nutrient runoff. Water and soil quality is improved (including an increase in organic matter).

Scenario Feature Measure: Acres of Forage and Biomass Planting**Scenario Unit:** Acre**Scenario Typical Size:** 10**Total Scenario Cost:** \$5,621.98**Scenario Cost/Unit:** \$562.20**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	10	\$696.22
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Manure	264	Organic matter can be used as organic fertilizer in agriculture	Ton	\$23.50	50	\$1,174.76
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hour	\$108.09	4	\$432.38
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Practice: 512 - Forage and Biomass Planting**Scenario:** #4 - Cool Season, Establish or Reseed, Organic, Foregone Income

Scenario Description: Establish/reseed adapted organic perennial introduced cool season grasses and legumes. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture or hayland. Assumes nutrients, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Includes foregone income for conversion of certified organic cropland, typically silage corn, to pasture or hay.

Before Situation: Typically installed on an a poor or nonexistent stand of grass species that is certified organic or transitioning to organic. Resource concerns include: sheet and rill erosion, ephemeral gully erosion, decreased water quality from runoff of sediment, low soil quality (including organic matter depletion) and low species diversity.

After Situation: Field is prepared for seeding, and lime and nutrients are spread according to soil test results. Organic cool season grasses and legumes are established on pasture or hayland. Erosion is minimized and there is reduced sedimentation and nutrient runoff. Water and soil quality is improved (including an increase in organic matter).

Scenario Feature Measure: Acres of Forage and Biomass Planting**Scenario Unit:** Acre**Scenario Typical Size:** 10**Total Scenario Cost:** \$9,172.47**Scenario Cost/Unit:** \$917.25**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	10	\$696.22
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Manure	264	Organic matter can be used as organic fertilizer in agriculture	Ton	\$23.50	50	\$1,174.76
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hour	\$108.09	4	\$432.38
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Foregone Income

FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$42.90	-15	(\$643.47)
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FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$419.40	10	\$4,193.95
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Practice: 512 - Forage and Biomass Planting**Scenario:** #5 - Warm Season, Native, Establish or Reseed

Scenario Description: Establish or reseed adapted perennial native warm season grasses. Used for either conventional or organic perennial native warm season grasses for pasture, hayland, or biomass crops. Assumes nutrients, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading.

Before Situation: Typically installed on an overgrazed, 10 acre pasture that is a weedy mix of cool season grasses. Plant productivity is poor, weed species dominate, and low water quantity and high temperatures during the summer months suppress the growth of the cool season forages. Resource concerns include: decreased water quality from runoff of sediment and/or manure from the field, low organic matter and soil fertility, poor plant health and vigor, and invasive or noxious weeds.

After Situation: Field is prepared for seeding, lime and nutrients are spread according to soil test results, and warm season grasses are established. Weeds are managed during establishment through mowing and chemical control. Pasture is managed for long-term grazing. Erosion is minimized and there is reduced sedimentation and nutrient runoff, and improved water and soil quality (including an increase in organic matter and fertility). Plant productivity during the "summer slump" increases and weed composition decreases. Livestock nutrition is improved and energy is saved by producing on-farm forage crops and reducing amount of imported feed.

Scenario Feature Measure: Acres of Forage and Biomass Planting**Scenario Unit:** Acre**Scenario Typical Size:** 10**Total Scenario Cost:** \$6,360.15**Scenario Cost/Unit:** \$636.02**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$6.92	10	\$69.15
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	500	\$390.64
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	10	\$2,209.75

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.12	10	\$61.21
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or	Each	\$171.69	1	\$171.69
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		with typical weights between 3,500 to 14,000 pounds.				
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Practice: 512 - Forage and Biomass Planting**Scenario:** #6 - Warm Season, Native, Establish or Reseed, Foregone Income

Scenario Description: Establish or reseed adapted perennial native warm season grasses. Used for either conventional or organic perennial native warm season grasses for pasture, hayland, or biomass crops. Assumes nutrients, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Includes foregone income for conversion of cropland, typically silage corn, to native/warm season pasture or hay.

Before Situation: Typically installed on an overgrazed, 10 acre pasture that is a weedy mix of cool season grasses. Plant productivity is poor, weed species dominate, and low water quantity and high temperatures during the summer months suppress the growth of the cool season forages. Resource concerns include: decreased water quality from runoff of sediment and/or manure from the field, low organic matter and soil fertility, poor plant health and vigor, and invasive or noxious weeds.

After Situation: Field is prepared for seeding, lime and nutrients are spread according to soil test results, and warm season grasses are established. Weeds are managed during establishment through mowing and chemical control. Pasture is managed for long-term grazing. Erosion is minimized and there is reduced sedimentation and nutrient runoff, and improved water and soil quality (including an increase in organic matter and fertility). Plant productivity during the "summer slump" increases and weed composition decreases. Livestock nutrition is improved and energy is saved by producing on-farm forage crops and reducing amount of imported feed.

Scenario Feature Measure: Acres of Forage and Biomass Planting**Scenario Unit:** Acre**Scenario Typical Size:** 10**Total Scenario Cost:** \$9,180.26**Scenario Cost/Unit:** \$918.03**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$6.92	10	\$69.15
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	500	\$390.64
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	10	\$2,209.75

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.12	10	\$61.21
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$8.38	10	\$83.81
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.12	10	\$111.19
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$16.57	10	\$165.69

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	10	\$3,463.58
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$42.90	-15	(\$643.47)

Practice: 512 - Forage and Biomass Planting**Scenario:** #7 - Rejuvenate

Scenario Description: Used to rejuvenate rundown pasture or hayland by applying nutrients and overseeding/sodseeding (frost, dormant, no-till, after aerator etc) adapted legumes or grass/legume mixes. Assumes lime, potassium and seeding costs.

Before Situation: Typical situation is a 10 acre pasture/hayfield with invasive weeds and poor legume composition. Existing stand of perennial grasses is in poor condition and percent ground cover is low. Overall plant diversity is low and is contributing to a decrease in soil quality. Biological nitrogen fixation is low and the reliance on nitrogen fertilizer is increasing.

After Situation: Approved legumes or grass/legume mixed are established and lime and potassium is spread to soil test recommendations. Ground cover and plant diversity improves and results in lower weed pressure. Plant productivity and soil quality improves from the increase in biological nitrogen fixation. Energy is saved through the use of legume nitrogen versus Haber-Bosch nitrogen

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,809.74

Scenario Cost/Unit: \$380.97

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	10	\$541.04

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Practice: 512 - Forage and Biomass Planting**Scenario:** #8 - Rejuvenate, Organic

Scenario Description: Used to rejuvenate rundown pasture or hayland on organic or transitioning to organic land by applying nutrients and overseeding/sodseeding (frost, dormant, no-till, after aerator etc) adapted legumes or grass/legume mixes. Assumes lime, potassium and seeding costs.

Before Situation: Typical situation is a 10 acre organic or transitioning to organic pasture/hayfield with invasive weeds and poor legume composition. Existing stand of perennial grasses is in poor condition and percent ground cover is low. Overall plant diversity is low and is contributing to a decrease in soil quality. Biological nitrogen fixation is low.

After Situation: Approved organic legumes or grass/legume mixed are established and lime and potassium is spread to soil test recommendations. Ground cover and plant diversity improves and results in lower weed pressure. Plant productivity and soil quality improves from the increase in biological nitrogen fixation.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,964.92

Scenario Cost/Unit: \$396.49

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	10	\$696.22
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1000	\$435.64
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.86	10	\$68.57
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.42	10	\$104.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.31	10	\$213.11

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Practice: 512 - Forage and Biomass Planting**Scenario:** #9 - Overseed

Scenario Description: Broadcast approved cool-season forage seeds (typically red and ladino clover) into existing pasture or hayland with low legume composition and low species diversity. Typically used for frost-seeding (early spring just after snowmelt), dormant seeding (late winter just before snowfall), or when soil is prepared using an aerator. Assumes seeding costs only, and should be used when pH and soil test nutrients are within an acceptable range .

Before Situation: 5 acres of pasture/hayland that was previously established as a grass/legume mix now has less than 5-10% legume composition. Forage and plant quality is poor due to low biological N fixation and species diversity. Small areas have bare soil resulting in erosion and establishment of weeds.

After Situation: Legume seed is broadcast in late winter or early spring. Legume composition is increased above 20% and forage and plant quality is improved due to an increase in species diversity and biological N fixation. Small bare areas of soil are covered with legumes and erosion and weed potential is reduced. Energy is saved through the use of legume nitrogen versus Haber-Bosch nitrogen.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 5

Total Scenario Cost: \$408.42

Scenario Cost/Unit: \$81.68

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	\$32.72	5	\$163.61
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$12.60	5	\$62.99
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Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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Practice: 512 - Forage and Biomass Planting**Scenario:** #10 - Overseed, Organic

Scenario Description: Broadcast approved, certified organic cool-season forage seeds (typically red and ladino clover) into existing organic or transitioning to organic pasture or hayland with low legume composition and low species diversity. Typically used for frost-seeding (early spring just after snowmelt), dormant seeding (late winter just before snowfall), or when soil is prepared using an aerator. Assumes seeding costs only, and should be used when pH and soil test nutrients are within an acceptable range .

Before Situation: 5 acres of organic or transitioning to organic pasture/hayland that was previously established as a grass/legume mix now has less than 5-10% legume composition. Forage and plant quality is poor due to low biological N fixation and species diversity. Small areas have bare soil resulting in erosion and establishment of weeds.

After Situation: Certified organic legume seed is broadcast in late winter or early spring. Legume composition is increased above 20% and forage and plant quality is improved due to an increase in species diversity and biological N fixation. Small bare areas of soil are covered with legumes and erosion and weed potential is reduced.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 5

Total Scenario Cost: \$756.53

Scenario Cost/Unit: \$151.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	5	\$348.11
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	\$32.72	5	\$163.61
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$12.60	5	\$62.99
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Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	1	\$171.69
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